

WHAT IS CLAIMED IS:

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1. A piezoelectric resonator comprising:
a piezoelectric resonating element; and
a first exterior substrate and a second exterior substrate laminated over and under, respectively, on said piezoelectric resonating element;
wherein each of said first exterior substrate and said second exterior substrate includes a multilayer substrate having at least one layer of an internal electrode.
 2. A piezoelectric resonator according to Claim 1, wherein said first exterior substrate and said second exterior substrate each have a first internal electrode and a second internal electrode provided via a substrate material layer and each have a capacitor provided therein.
 3. A piezoelectric resonator according to Claim 1, wherein each of said first exterior substrate and said second exterior substrate includes a pair of a first internal electrode and a second internal electrode provided at the same height level, a third internal electrode provided with the first and second internal electrodes via a substrate material layer, and capacitors provided between said first internal electrode and said third internal

electrode and between said second internal electrode and said third internal electrode, respectively.

4. A piezoelectric resonator according to Claim 2, wherein the first internal electrode of said first exterior substrate and the first internal electrode of said second exterior substrate are connected to a first electric potential and a second electric potential, respectively, and the second internal electrode of said first exterior substrate and said second exterior substrate are each grounded.

5. A piezoelectric resonator according Claim 1, wherein said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer.

6. A piezoelectric resonator according Claim 4, wherein said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer.

7. A piezoelectric resonator according to Claim 1, further comprising a ground electrode wound around a top surface, a pair of side surfaces, and a bottom surface of a laminate body defined by the first and second exterior substrates and the piezoelectric resonating element.

8. A piezoelectric resonator according to Claim 1, wherein said first and second exterior substrates each includes a multilayer substrate.

9. A piezoelectric resonator according to Claim 1, wherein a concave portion is included in a primary surface of said first and second exterior substrates which and the primary surface defines the surface to be laminated on the piezoelectric resonating element, the concave portion defines a space such that vibration of the piezoelectric resonating element is not hindered.

10. A piezoelectric resonator according to Claim 1, wherein said first and second exterior substrates include a plurality of substrate material layers laminated together.

11. A piezoelectric oscillator comprising:
a built-in load capacitance type piezoelectric

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oscillator including:

a piezoelectric resonating element; and
a first exterior substrate and a second exterior substrate, which are laminated over and under, respectively, said piezoelectric resonating element, and which constitutes a three-terminal capacitor connected to said piezoelectric resonating element; wherein

said first exterior substrate and said second exterior substrate each includes a multilayer substrate having at least one layer of an internal electrode.

12. A piezoelectric oscillator according to Claim 11, further comprising an input electrode, an output electrode, and a ground electrode provided on the surface of a laminate body defined by said piezoelectric resonating element, said first exterior substrate, and said second exterior substrate, wherein said input electrode, said output electrode, and said ground electrode are connected to the corresponding terminals of said three-terminal capacitor constituted by said first exterior substrate and said second exterior substrate.

13. A piezoelectric oscillator according to Claim 12, wherein each of said first exterior substrate and said second exterior substrate each includes a pair of a first

internal electrode and a second internal electrode provided at the same height level, a third internal electrode provided with the first and second internal electrodes via a substrate material layer, and said first internal electrode, said second internal electrode, and said third electrode are connected to said input electrode, said output electrode, and said ground electrode, respectively.

14. A piezoelectric oscillator according to Claim 12, wherein said first exterior substrate includes a first internal electrode connected to said input electrode and a second internal electrode which is provided with said first internal electrode via a substrate material layer and which is connected to said ground electrode, and said second exterior substrate includes a third internal electrode connected to said output electrode and a fourth internal electrode which is provided with said third internal electrode via a substrate material layer and which is connected to said ground electrode.

15. A piezoelectric oscillator according to Claim 11, wherein no electrode is provided on the top surface of each of said first exterior substrate and said second exterior substrate.

15. A piezoelectric oscillator according to Claim 11, wherein said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer.


16. A piezoelectric oscillator according to Claim 13, wherein said first exterior substrate and said second exterior substrate each include a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer.

17. A piezoelectric oscillator according to Claim 11, further comprising a ground electrode wound around a top surface, a pair of side surfaces, and a bottom surface of a laminate body defined by the first and second exterior substrates and the piezoelectric resonating element.

18. A piezoelectric oscillator according to Claim 11, wherein said first and second exterior substrates each includes a multilayer substrate.

19. A piezoelectric oscillator according to Claim 11,

wherein a concave portion is included in a primary surface of said first and second exterior substrates which and the primary surface defines the surface to be laminated on the piezoelectric resonating element, the concave portion defines a space such that vibration of the piezoelectric resonating element is not hindered.

 20. A piezoelectric oscillator according to Claim 11, wherein said first and second exterior substrates each includes a plurality of substrate material layers laminated together.